



# Before & After

A series of conservation projects with before & after images showing how Iowa NRCS and our partners help private landowners address natural resource concerns on their land



United States Department of Agriculture  
Natural Resources Conservation Service  
Helping People Help the Land

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# Denitrifying Bioreactor/Water Monitoring



Location  
**Hamilton County**

Years  
**2009-2011**

Resources Treated  
**Water Quality  
Nutrient Management**

Project Partners  
**Iowa Soybean  
Association (ISA)  
Iowa State University  
Iowa Learning Farm  
USDA-NRCS  
Landowner**

Funding Source  
**Landowner  
Iowa Soybean  
Association (ISA)  
Mississippi River Basin  
Healthy Watersheds  
Initiative (MRBI)  
USDA-NRCS**



## Background:

Denitrifying bioreactors are underground structures filled with wood chips that intercept and treat tile water. They help reduce nitrate levels in water leaving agricultural land. The newly constructed bioreactor at left is about 3,900 square feet.

## Success:

Hamilton County farmer Arlo Van Diest has two bioreactors – one installed by the Iowa Soybean Association (ISA) and another through USDA-NRCS. Both are helping improve water quality where there is concentration of nitrogen of subsurface, or ground, water. Keegan Kult (below) monitors the ISA installed bioreactors regularly for water quality.



Photos by Lynn Betts



# Filter Strip



Location  
**Wapello County**  
**Cedar Creek**

Year  
**1995**

Resources Treated  
**Water Quality**  
**Sediment Reduction**  
**Nutrient Management**  
**Wildlife Habitat**

Project Partners  
**USDA-FSA**  
**USDA-NRCS**  
**Landowner**

Funding Source  
**Landowner**  
**Conservation Reserve**  
**Program (CRP)**



**Background:** The number one water pollutant in Iowa is sediment, and a lot of that comes from runoff from adjacent cropland. Along with a high residue management system, several other conservation practices can help crop producers reduce the amount of sediment running into adjacent streams. Practices such as terraces, contour buffer strips, and grassed waterways can reduce in-field erosion. A final stop-gap to keep sediment and other pollutants from water is a filter strip - an area of vegetation along a water course used to reduce pollutants from runoff to improve water quality.

**Success:** The landowner installed a filter strip along Cedar Creek in 1995. He is seeing improved water quality and more wildlife in the area.





# Floodplain Restoration



Location  
**Linn County**

Year  
**2010**

Resources Treated  
**Flooding  
Sediment Runoff  
Water Quality  
Wildlife Habitat**

Project Partners  
**USDA-NRCS**

Funding Source  
**Emergency Watershed  
Protection Program-Flood-  
plain Easements (EWP-FPE)  
American Recovery and  
Reinvestment Act of 2009  
(ARRA)**

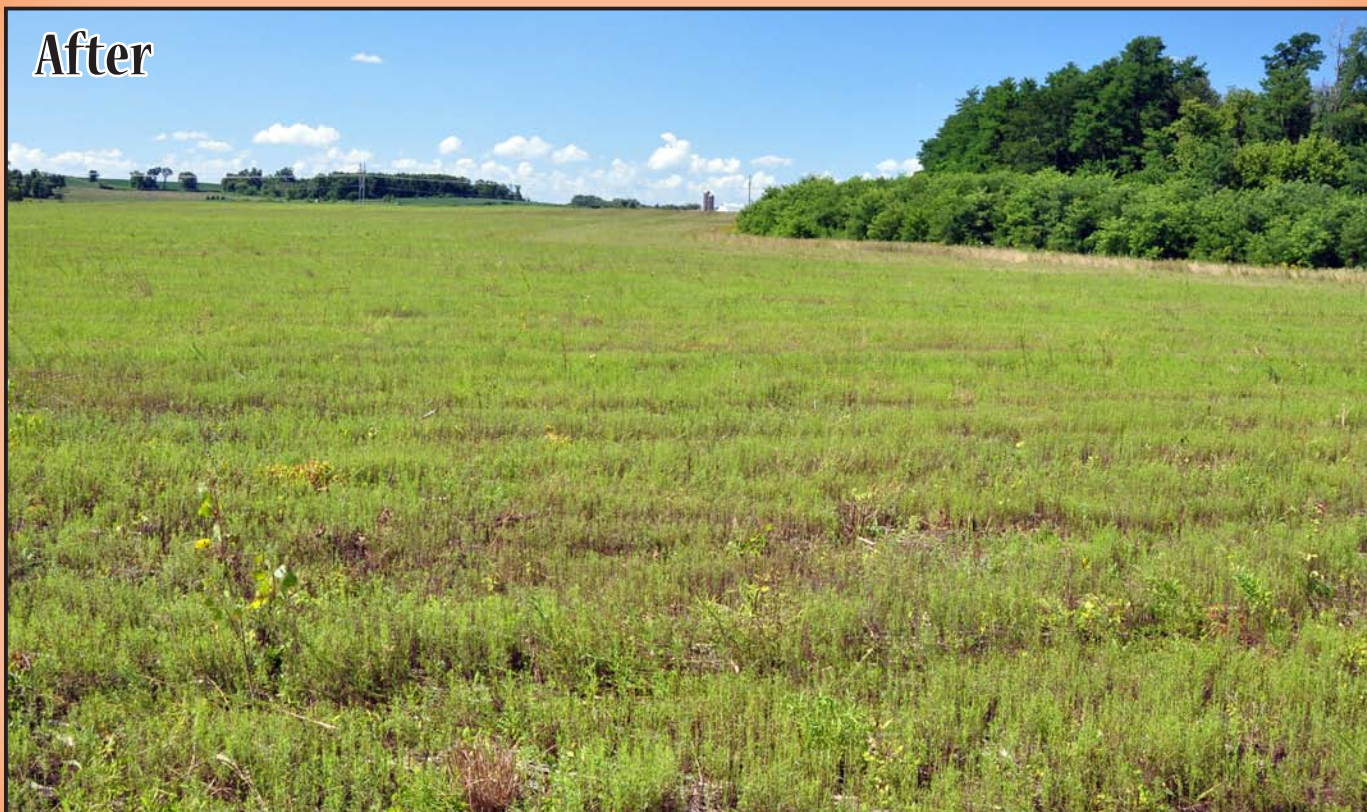
**Before**



**Background:** Craig Byers experienced flooding more years than not on his 480-acre cropland that sits in a floodplain near the Cedar River. Flooding meant sediment delivery to the nearby river and, oftentimes, a ruined crop. So when the USDA offered to place the flood-prone cropland into a permanent easement, Byers took the offer.

**Success:** Restoration work on Byers' cropland consisted of drilling in a native seed mix that fits the local ecosystem. If that land floods now, the floodwater will slowly recede back into the river without causing damage to the environment, infrastructure or valuable crops. The native grasses in floodplains also serve as good habitat for wildlife.

**After**







Location  
**Pottawattamie County**

Year  
**2010**

Resources Treated  
**Soil Erosion**  
**Wildlife Habitat**

Project Partners  
**USDA-NRCS**  
**Iowa State University**

Funding Source  
**Iowa State University**

# Grassed Waterway

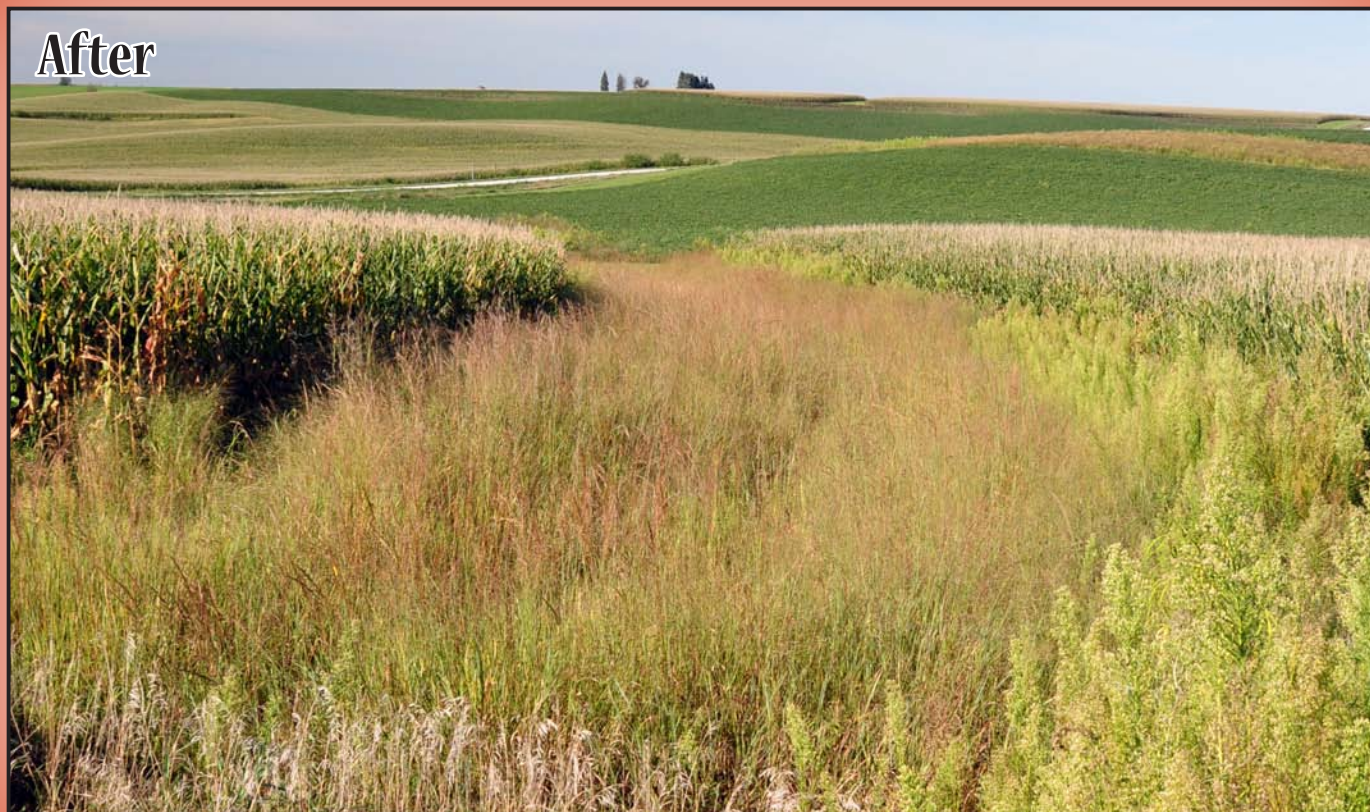
**Before**



**Background:** A gully formed in cropland at Iowa State University's Armstrong Research Farm near Lewis. Gully erosion is caused by areas of concentrated flows of water down a slope. One of the best conservation practices to fix gully erosion is a grassed waterway.

**Success:** To combat the gully, the Armstrong Research Farm crew seeded down a grassed waterway of permanent vegetative cover. Waterways are designed in a parabolic, or dish, shape wide enough and deep enough to carry peak runoff from a 24-hour storm. Following installation, fabric checks were installed to help control ephemeral gully erosion. Fabric checks are required on all NRCS-funded waterway installations in the East Pottawattamie Soil & Water Conservation District (SWCD).

**After**





# Prescribed Burning



Location  
**Wayne County**

Year  
**2011**

Resources Treated  
**Soil Erosion**  
**Wildlife Habitat**

Funding Source  
**Landowner**  
**Conservation Reserve**  
**Program (CRP)**

## Before



**Background:** The landowner worked with the local fire department to implement a prescribed burn on his tall grass prairie CRP land. (The Farm Service Agency requires mid-contract management, such as a prescribed burn, during the CRP contract.) His goal was to control the invasion of cool season introduced species and some woody plants.

**Success:** Following the burn, the landowner noticed a strong comeback and increased diversity of the forb (native flower) component of the prairie. Prescribed burns also help enhance seed production, control plant disease, and improve wildlife habitat.

## After





# Prescribed Grazing



Location  
**Mahaska County**

Year  
**2011**

Resources Treated  
**Soil Erosion  
Plant Condition/  
Livestock  
Wildlife Habitat**

Project Partners  
**USDA-NRCS  
Landowner**

Funding Source  
**Landowner  
Environmental Quality  
Incentives Program  
(EQIP)**

**Before**



## **Background:**

With continuously grazed pastures, livestock tend to congregate in areas and form trails, leading to bare, eroded soils. If a farm pond is supplying water, cattle often stand in these areas causing animal health issues and poor water quality.

## **Success:**

A Mahaska County father-son grazing operation implemented a grazing system where they successfully graze 100 stockers per acre using temporary fences and move water with the cattle. This type of system allows plants sufficient time to recover and for diverse wildlife and plant species to move in. This system also provides the animals optimal feeding and weight gain.

**After**





# Rain Garden



Location  
**Polk County**

Year  
**2009**

Resources Treated  
**Water Quality**  
**Water Quantity**  
**Flood Reduction**

Project Partners  
**Polk SWCD**  
**IDALS-DSC**  
**Landowner**

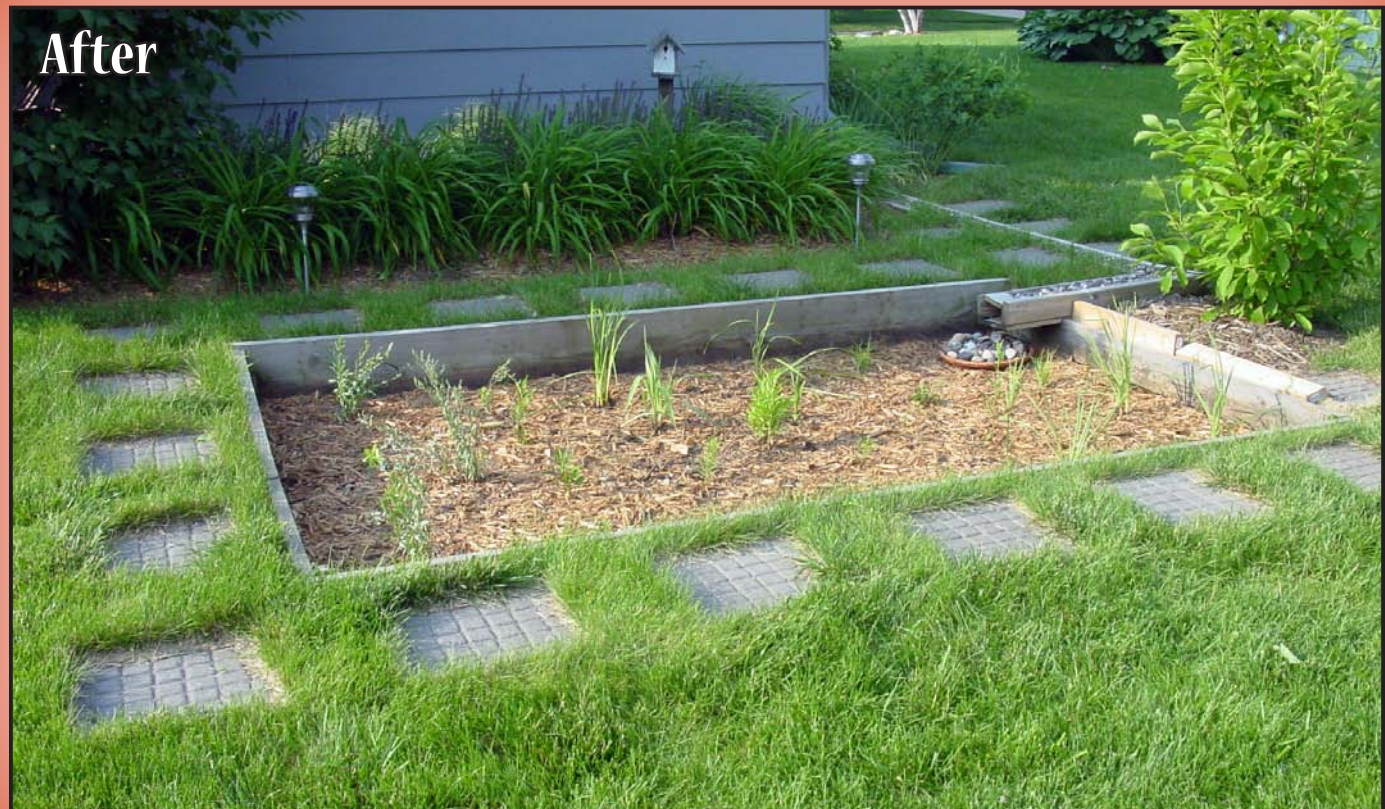
Funding Source  
**Landowner**



**Before**

**Background:** Like so many suburban homeowners, Paul Miller's yard had areas of ponding following heavy rains. Storm water runoff from impervious surfaces (i.e. rooftops, driveways, patios) carries pollutants like grass clippings, hydrocarbons, and sediment to receiving waters without treatment. Rain gardens are shaped like shallow bowls. They are built with amended soils with high percolation rates and planted with native plants and flowers to capture and infiltrate water before it can reach any water bodies.

**Success:** Miller placed his rain garden in his backyard near enough to the downspout to capture rainwater from his roof. He estimates that about 100,000 gallons of rainwater will flow into his rain garden annually.



**After**



# Restored Wetland



Location  
**Plymouth County**

Years  
**2006-07**

Resources Treated  
**Flood Reduction  
Water Quality  
Sediment Runoff  
Wildlife Habitat**

Project Partners  
**Landowner  
USDA-NRCS**

Funding Source  
**Landowner  
Wetlands Reserve Program (WRP)**

**Before**



## **Background:**

Cropland adjacent to the Big Sioux River in northwest Iowa frequently flooded and was eventually used for hayland. By the mid 2000s the land was too wet to even get a solid hay crop.

## **Success:**

The landowner transitioned a portion of the ground to wetlands. A new landowner purchased the property and restored the remainder to wetlands through the Wetlands Reserve Program (WRP). The new owner uses the newly created wildlife habitat for hunting. The wetland complex is also used for family recreational outings such as camping and fishing in the adjacent river.

**After**





# Riparian Buffer Strip



Location  
**Bear Creek  
Story County**

Year  
**1990**

Resources Treated  
**Streambank Erosion  
Sediment Runoff  
Water Quality  
Wildlife Habitat**

Project Partners  
**Iowa State University  
Iowa DNR  
Pheasants Forever  
USDA-NRCS**

Funding Source  
**Iowa State University  
Iowa DNR  
Pheasants Forever  
USDA-NRCS**



**Before**

**Background:** Bear Creek in Story County is much like many streams in Iowa that run through areas of intensive cropping or heavy grazing. The creek's banks had eroded, the creek bottoms were loaded with sediment, and the water quality was degraded by high concentrations of suspended solids, nutrients, and agricultural chemicals.

**Success:** A conservation partnership implemented a restoration plan. The team installed a multi-species riparian buffer strip to reduce the impact of non-point source pollution on the creek. The buffer includes an outside area of undisturbed trees, a middle area of managed fast-growing trees, and a strip of grass along the creek to intercept surface runoff.



**After**



# Steel Roofed Livestock Building



Location  
**Shelby County**

Year  
**2008**

Resources Treated  
**Manure Runoff**  
**Soil Erosion**  
**Water Quality**

Funding Source  
**Landowner**  
**Environmental**  
**Quality Incentives**  
**Program (EQIP)**

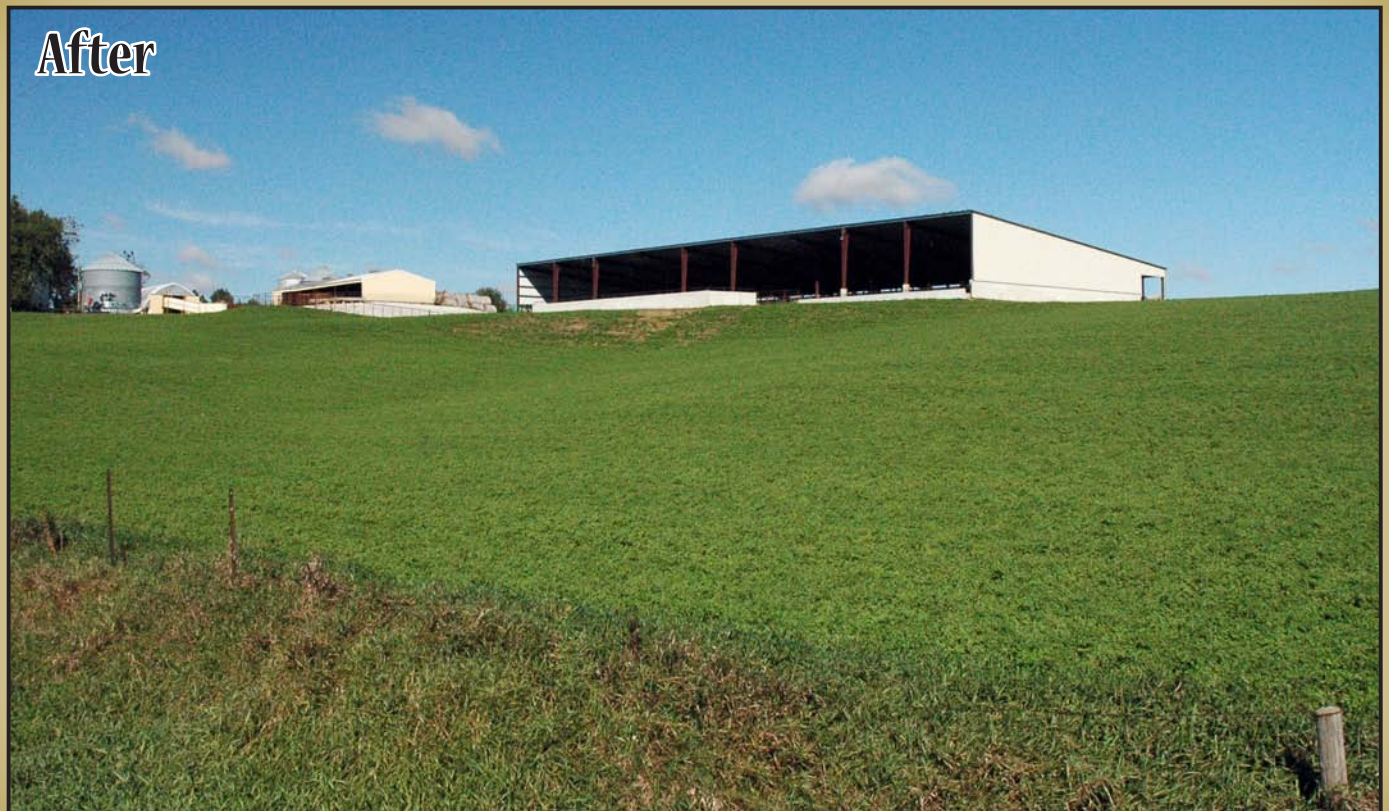
**Before**



**Background:** Cattleman Clint Sonderman battled manure runoff issues, particularly during spring snowmelt, on his 20-acre feedlot. In October 2008, he installed a 20,000 square foot total containment monoslope building for his 500-head livestock feeding operation. The new building includes three pens and cornstalks for bedding.

**Success:** Sonderman's monoslope building totally eliminates the manure runoff and soil erosion issues he faced with his open feedlot, thus improving water quality in nearby streams. The new facility also allows for better manure utilization and is helping him produce healthier, more productive livestock.

**After**





# Stream Crossing/Stabilization



Location  
**Jordan Creek**  
**Pottawattamie County**

Year  
**2009**

Resources Treated  
**Streambank Erosion**  
**Streambank Degradation**  
**Wildlife Habitat**

Project Partners  
**Pottawattamie Co.**  
**USDA-NRCS**  
**Hungry Canyons**  
**Alliance**  
**IDALS-DSC**  
**East Pottawattamie SWCD**

Funding Sources  
**Watershed Protection**  
**Fund (WSPF)**  
**Hungry Canyons**  
**Clean Water Act**  
**(Section 319)**  
**Landowners**



**Before**

**Background:** There were several reasons and partners with interest in this project. Pottawattamie County needed something done along Jordan Creek to reduce erosion beneath a bridge. That stretch of the creek was also the most unstable, and needed to be stabilized. Additionally, an old stream crossing (left) that allowed a farmer to access his field was ready to collapse.

**Success:** The final Jordan Creek Watershed Project included large-scale streambank stabilization and a new crossing upstream from the old location. This project stabilizes the stream bed and banks along a two mile stretch, and allows the farmer easier access to cropland on the other side of Jordan Creek.



**After**



# Streambank Stabilization



Location  
**South Canoe Creek  
Winneshiek County**

Year  
**2010**

Resources Treated  
**Streambank Erosion  
Wildlife Habitat**

Project Partners  
**Seed Savers Exchange™  
Iowa Natural Heritage  
Foundation (INHF)  
Iowa DNR  
USDA-NRCS  
Trout Unlimited**

Funding Source  
**Landowner  
Cooperative  
Conservation  
Partnership  
Initiative (CCPI)**

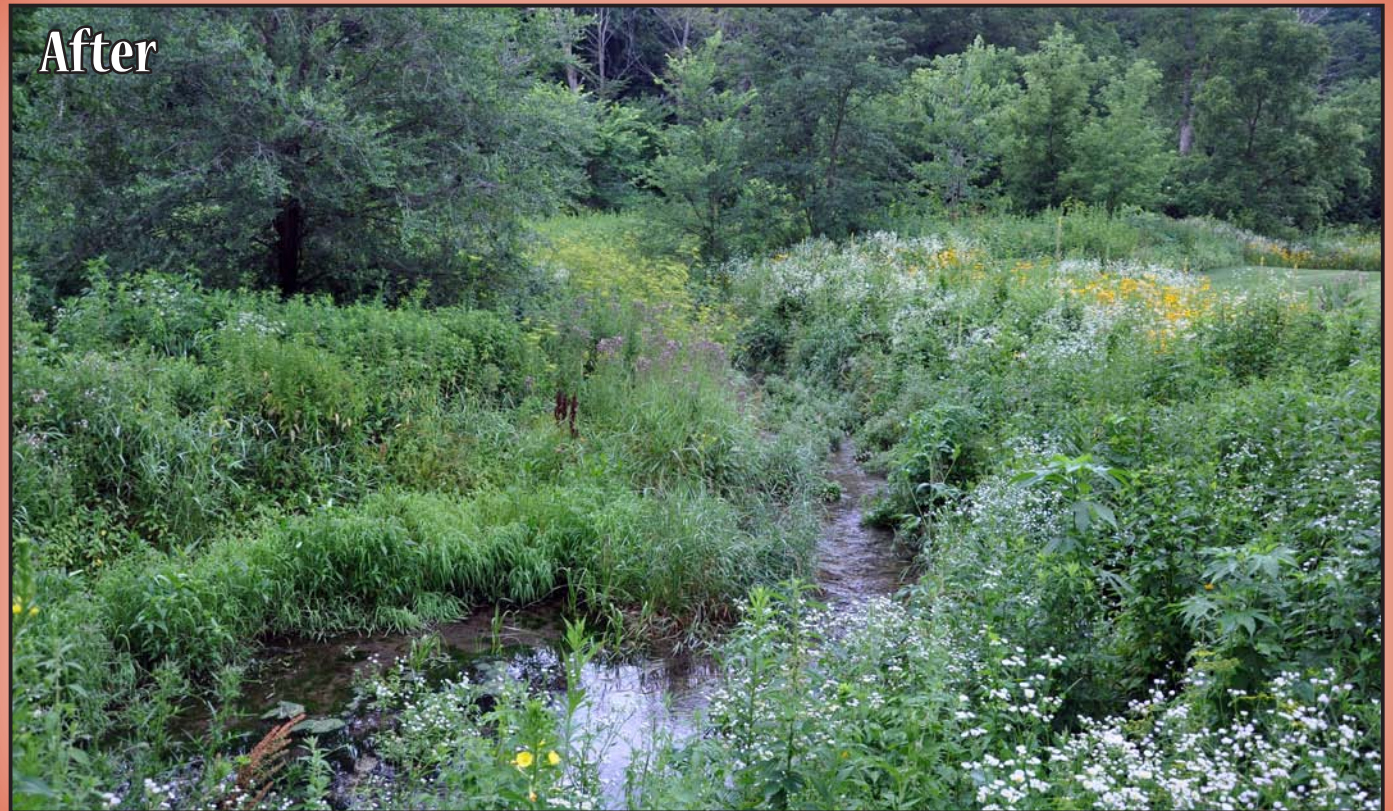
**Before**



**Background:** In the summer of 2010 the non-profit group Seed Savers Exchange™ stabilized 1,915 feet along the banks of a trout stream – South Canoe Creek. The project included removing trees and other brush from the area and reducing the slope of the bank to provide a suitable condition for native vegetation. Rip rap and fish hides were also installed along portions of the stream project.

**Success:** Now that vegetation is established along South Canoe Creek, sediment delivery from stream banks is being reduced. This project is producing a healthier stream through cleaner water for natural brook trout spawning.

**After**





# Terraces



Location  
**Montgomery County**

Year  
**2009**

Resources Treated  
**Soil Erosion**  
**Wildlife Habitat**  
**Water Quality**

Funding Source  
**Landowner**  
**American Recovery and**  
**Reinvestment Act of 2009**  
**(ARRA)**

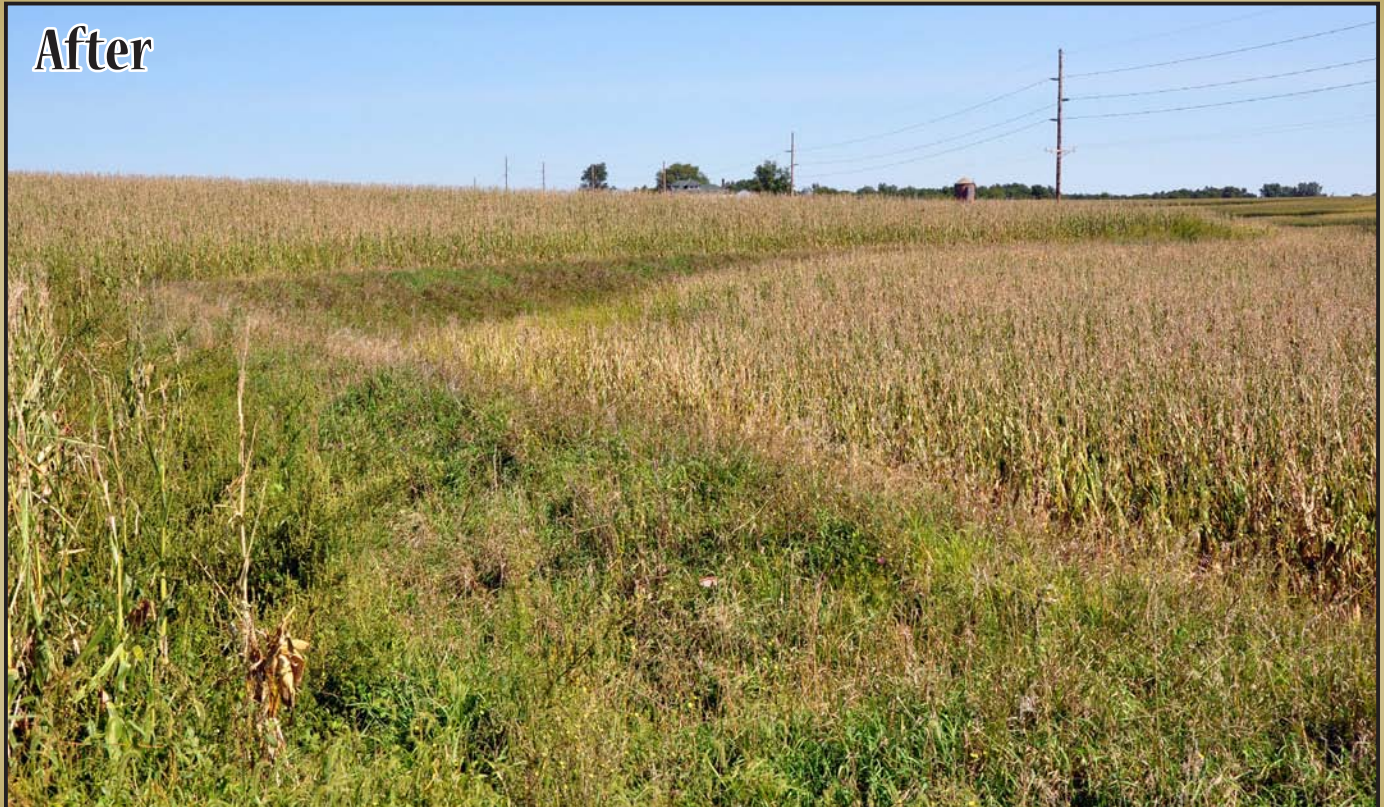
**Before**



**Background:** Seven Montgomery County landowners in the Hacklebarney Watershed took advantage of special funding on conservation practices through the American Recovery and Reinvestment Act of 2009 (ARRA). This landowner installed tile outlet terraces on cropland that is highly susceptible to soil erosion.

**Success:** The landowner's newly constructed terraces did the job reducing soil erosion during near-record rainfall totals in June 2011. This erosion reduction will ultimately help maintain soil quality and reduce sediment delivery to nearby ditches.

**After**





# Watershed Dam/Road Structure



Location  
**Bear Creek Watershed  
Site 26  
Winneshiek County**

Years  
**2010-2011**

Resources Treated  
**Flooding  
Soil Erosion  
Sediment Runoff**

Project Partners  
**Winneshiek SWCD  
Winneshiek County  
Bear Creek  
Advisory Board  
USDA-NRCS**

Funding Source  
**American Recovery and  
Reinvestment Act of 2009  
(ARRA)  
Winneshiek County**



**Background:** Special federal funding in 2009 allowed the Bear Creek Watershed Project to add several new flood control structures. The watershed covers parts of four counties in northeast Iowa and southeast Minnesota.

**Success:** Site 26 is a combination watershed dam and new road structure. The completed structure levels the steep side slopes along the road. That area can now be mowed and the road is safer for traffic and snow removal. The pool area will impound the runoff from a 50-year rainfall event, and a significant amount of damage to local infrastructure is being reduced below this and other new structures in the watershed.





## **NRCS Offers Conservation Planning**

With an office in every Iowa county, USDA's Natural Resources Conservation Service (NRCS) has conservationists nearby to help you through the conservation planning process. The Before & After projects in this brochure, for example, were part of a conservation plan designed specifically for that farm, property or watershed.

NRCS employs soil conservationists, agricultural engineers, soil scientists, wetland specialists, and other experts to help you develop a plan that addresses resource concerns on your farm, including soil erosion, water quality, wildlife habitat, and energy efficiency.

## **NRCS Provides Financial Assistance**

In addition to providing free, voluntary technical assistance, NRCS administers several conservation programs that help reduce the cost of installing conservation practices.

One of our main programs that helps fund conservation is the Environmental Quality Incentives Program (EQIP). This program helps eligible landowners fund the cost of installing or implementing structural, vegetative and management practices on eligible agricultural land.

Through EQIP, NRCS provides assistance in the implementation of practices such as grassed waterways, animal waste storage facilities, cover crops, and nutrient management activities. In fiscal year 2011, NRCS provided more than \$25 million in financial assistance to Iowa farmers to install such practices.



# Before & After



**November 2011**  
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